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C 16435

COUNTRY: Switzerland

SUBJECT: Swiss Experience in Stationary Gas Turbine Manufacture and Operation/
Oil Ash CorrosionPLACE: ~~-----~~
25X1A6aDate Acq: ~~-----~~

Date of Info: 1951 25X1X6

SOURCE: ~~-----~~

1. At the London Symposium on Gas Turbines February 21-22, 1951, representatives of Sulzer Bros., Switzerland presented four papers on stationary gas turbine corrosion, manufacture, and operational problems.

2. Dr. W. Sigfried of Sulzer Bros. reported on corrosion tests made on a 20,000 KW stationary gas turbine. The turbine blades and rotor of this machine were made of G18B. Sigfried reported on the analysis of the corrosive ash deposit found on the turbine blades as follows: 25X1A9a

Chemical Analysis of Oil Ash Deposits in Sulzer Turbine

Turbine Stage	Vanadium	Fe	SO ₂	Na ₂ O
1st	43%	20%	12%	-
3rd	36%	27%	12%	-
5th	34%	24%	14%	7%
9th	34%	2%	6%	12%

3. Sigfried concluded that further improvement in corrosion resistance coatings must be made to keep preventive maintenance cost and time to reasonable figures. He added that during the subject tests a chalk coating was found to be the most effective protection to turbine blades.
4. Mr. Huber discussed Sulzer Bros. turbine design. For ^{large} rotors (turbine wheels) he greatly favored welded construction because of its cheapness and easier replacement. He discussed some of the problems of welding G18B and mentioned that Sulzer was using ultrasonic techniques for the testing of welds.
5. He also discussed the severity of heating stresses caused during starting and pointed out that the warm-up time should increase as the square of the turbine wheel diameter.

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6. In reviewing Sulzer's experience in gas turbine operation, Huber concluded that the present costs of manufacture and operation are too high. He added that running time between overhauls and in operating efficiencies must both be increased before the gas turbine can compete with an efficient steam unit. To point up the expense of machining turbine blades he stated that only 13% of the blade stock remained after machining, leaving 87% of the material as waste. He suggests the advisability of cheap fabrication by stamping, cheap forming, or for expensive materials - precision casting. For economy of operation and decreased down time he recommends good specifications for fuels. At present no heavy fuel oils are suitable for use and Huber was inclined to agree with D. Keller of Escher Wyss, Switzerland that a reasonable solution of the oil ash corrosion problem may lie in the use of fuel additives.

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